

# Ice, Ice Baby: How an Ice Storm Causes Power Outages

Over the past two weeks, Southwestern Ontario has seen a wide range of weather, from high winds and drastic temperature changes to freezing rain and snow precipitation.

For electricity distributors and transmission companies, ice storms pose one of the highest levels of risk. Ice storms can cause significant damage to critical feeder lines that carry power from substations to consumers, resulting in widespread power outages. The process of how an ice storm takes down a hydro feeder involves several stages:

1. **Accumulation of ice:** An ice storm occurs when there is precipitation in the form of freezing rain, which freezes on surfaces, including overhead power lines. Over time, the ice builds up, increasing the weight on the power lines.
2. **Increased weight on power lines:** The weight of the ice can cause the power lines to sag, creating a potential hazard. If the sagging lines come into contact with trees or other objects, it can cause a short circuit or damage to the lines.
3. **Galloping Lines:** Windy conditions can cause power lines to “gallop” or “whip” creating substantial forces on the poles, cross arms, insulators, and connectors. This occurrence is especially pronounced with ice-covered lines with additional sag.
4. **Broken poles and power lines:** The weight of the ice and galloping lines can become too much for the poles and power lines to bear, causing them to break. When power lines break, they can fall to the ground, causing damage to the infrastructure or creating a safety hazard.
5. **Fallen trees and branches:** Ice buildup can also cause trees and branches to break and fall onto power lines,

causing damage or creating a safety hazard. Fallen trees and branches can also damage other infrastructure, such as transformers or substations.

6. **Power outages:** When power lines are damaged or broken, it can cause power outages in affected areas. The length, severity, and number of customers impacted by the power outage depend on the extent of the damage and how quickly the utility company can make repairs.



In the case of the recent ice storm that impacted Elgin County on February 22<sup>nd</sup> – 23<sup>rd</sup>, significant amounts of ice accumulated on the distribution feeders at the east end of St. Thomas, which supply power to the entire town of Port Stanley. The ice accumulation eventually toppled 25 poles, cutting off power supply to a vast territory to the east and south of St. Thomas. Damage of this magnitude required significant effort and resources as all 25 poles had to be cleared, reset, hardware transferred, lines spliced, and restrung. When this type of damage occurs on a section of line that hosts multiple feeders it creates further challenges to restore power in a timely fashion.

In this situation, EARTH Power was able to work with Hydro One

to temporarily re-route power from another supply point to pick up the impacted customers. Unfortunately, this type of back-feeding solution is not always available, and even when it is, supply constraints usually limit how much load can be safely transferred.

Following a major event like this, EARTH Power and its partners conduct a review of the outage response to continue improving reliability and communications for our customers. We understand that power outages are extremely frustrating and inconvenient. As Your Hometown Utility, keeping you connected with electricity and updates is a top priority. We thank all of our customers who were impacted by the recent ice storm for your patience and support while we worked with Hydro One to restore power as quickly and safely as possible.